

Total Quality Management Practices and their Effects on Organizational Performance

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This paper reports a study designed to examine the key concepts of TQM implementation and their effects on organizational performance. Process Alignment and People Involvement are two key concepts for successful implementation of TQM. The purpose of this paper is to discuss how these two constructs affect organizational performance. The results provide useful insight into the organization that uses TQM as a organization development program.

Keywords: TQM, Process Alignment, People Involvement

TQM strategies represent a paradigm shift from the earlier strategies of the 1980s in the approach to management science. Studies showed that TQM was positively associated with performance outcome, such as financial performance and profitability (Cummings & Worley, 2001; Lawler et al, 1995) as well as with human outcomes, such as employee satisfaction, employee relations, and customer satisfaction (Lawler et al, 1995). Although many TQM studies have been done to discuss the concept and principles, the key to successful TQM program is not fully understood (Weintraub, 1993). According to Rivers and Bae (1999), successful implementation of TQM require a transportation of organizational information system infrastructure and other management systems so that they are aligned with the new TQM environment. Powell (1995) suggested that tacit resources such as organizational culture, commitment, empowerment and business processes drive TQM success. Sahney (1991) pointed out key concepts to implementation TQM, which included: top management leadership, creating a corporate framework for quality, transforming corporate culture, a collaborate approach to process improvement, integration with the process etc. However, for TQM to be successful, management processes must be aligned and integrated within a TQM environment. For example, the bureaucratic system must be transformed, strategies must be aligned, and information system must be integrated to make sure the TQM success. Some studies showed that it is important for top management take a leadership role and shows a strong commitment at the time of implementing TQM (Lee & Asllani, 1997; Rivers & Bae, 1999; Weintraub, 1993). Also Weintraub (1993) pointed out that the quality management process will be successful only when it becomes integrated with every employee's activities.

Although reports of TQM success are plentiful in the popular literature, there are also reports of problems (Cummings & Worley, 2001; Powell, 1995; Fortune, 1991). Many affecting factors of success TQM practices that result in performance, core processes and people are two major points to drive TQM success.

However, more empirical studies are needed to show the contribution of organizational variables such as structure, strategy, information technology, human resources, leadership, culture, and employee participation on the success of TQM programs (Nadler, 1998; Tushman and O'Reilly, 2002). It is the intention of this study to examine the impact of organizational variables, specifically the alignment of structure, strategy and information technology, and executive commitment and employee empowerment, on TQM programs and the final performance outcomes. Therefore, this study suggested that Process Alignment and People Involvement are two constructs which influence the organizational performance when the organizations perform TQM initiatives. Process Alignment (PALI) consists of three variables – structure, strategic and IT alignment. People Involvement (PINV) consists of two variables – executive commitment and employee empowerment.

The purpose of this research is to examine relationship between two TQM concepts and their impact on organizational performance. Specifically, this study addresses the following research questions:

1. What is the relationship between Process Alignment and Organizational Performance, especially, when organizations practice TQM initiatives? To what extent, do the components of Process Alignment affect Organizational Performance?
2. What is the relationship between People Involvement and Organizational Performance, especially, when organizations practice TQM initiatives? To what extent, do the components of People Involvement affect Organizational Performance?

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Theoretical Framework

The theoretical foundation for this study is the TQM, Process Alignment, and People Involvement. Process Alignment can be interpreted as the organizational effort needed to make the processes the platform for organizational structure, for strategic planning, and for information technology (Hammer, 1996; Spector, 1995). The aim of Process Alignment is to arrange the various parts of the company to work in harmony in pursuit of common organization goals, in order to improve performance and sustain competitive advantage (Weiser, 2000). According to Organizational theory, organizations are required to design their structures and systems to align the contingencies of environment, strategy, technology, and so on for survival and success (Daft, 1998; Lewin, 1999). Many previous studies have empirically demonstrated the positive effect of alignment on organizational effectiveness (Lawrence and Lorsch, 1967; Gresov, 1989; Roth et al., 1991). Alignment theory (Semler, 1997) suggested that employee behavior consonant and organizational goal work together through structural change, strategy usage and culture transformation. Specifically, Weiser (2000) stated that in order to link all areas of the organization and serve as an informational lifeline throughout the change and alignment process, the organizational structure needs to be redesigned to cross-functional. Grover et al. (1997) pointed out that IT as a transformational subsystem is imperative in culture transformation. Therefore, when an organization is appropriately aligned, organizational structure, strategic planning and IT correspond to organizational core processes and objectives, ensuring competitive advantage.

In sum, consistence with alignment theory and further IT implementation are related to organizational performance (Davenport, 1993; Grover et al., 1997; Hammer and Champy, 1993; Ostroff, 1999; Spector, 1995; Thompson and Strickland, 1999). The following hypothesis should be conducted:

- H 1 Process Alignment is positively associated with Organizational Performance
 - H 1-1 Horizontal structure is positively associated with Organizational Performance
 - H 1-2 Strategic Alignment is positively associated with Organizational Performance
 - H 1-3 IT Alignment is positively associated with Organizational Performance

From previous studies (Lee & Asllani, 1997; Rivers & Bae, 1999; Weintraub, 1993), for TQM to be successful, it must have the commitment and involvement of top management. In addition, scholars (Allender, 1994; Powell, 1995; Waldman, 1994) suggested that employee empowerment which included employee involvement and gave employees greater autonomy is one of principles to continue improvement to guide the implementation of TQM. As a result, the following hypothesis should be conducted:

- H 2 People Involvement is positively associated with Organizational Performance
 - H 2-1 Executive commitment is positively associated with Organizational Performance
 - H 2-2 Employment empowerment is positively associated with Organizational Performance

Methodology

Questionnaire Developments and Data Collection

The questionnaire consisted of four parts, which related to the evaluation information on general information about the company; how well organizational structure, information technology, and strategy aligned with core processes; commitment of top executive management and employee empowerment; and perceived level of business performance. The scale to measure the above variables were developed based on a review of the previous literature. The five points Likert scale was used for the questionnaire.

Two steps were followed in this study to establish the validity and reliability of the questionnaire. First, data were collected and analyzed on the content and face validity by a panel of experts. The questionnaire was also changed per their suggestions. Second, the revised questionnaire was piloted with 90 post-graduate final year Executive MBA students from the Australian Graduate School of Management. The data collected from the pilot test, with a response rate of 52%, was coded and analyzed using statistical software SPSS to find any unanticipated difficulties and no significant problems were found. Cronbach's alpha was used to determine the internal consistency of the instrument. All scales were highly reliable and consistent ($0.6298 < \alpha < 0.8389$).

The target population of this survey is the Top 1000 companies in Australia based on market capitalization, as reported by MOS Data Assembly Specialists. As preliminary opinion survey suggested that a top executive would be the most appropriate key informant. The actual number of companies surveyed (950) was fewer than 1000 because of acquisitions and mergers. Several efforts such as a telephone follow-up campaign and a follow-up fax was made to encourage the respondents to complete and return the questionnaire. A total of 333 questionnaires

were received from the 950 questionnaires distributed. 73 questionnaires were discarded. This comprised 62 questionnaires that were returned unfilled, 10 that were incomplete, and one that was undeliverable. A total of 260 questionnaires were usable, which represents a response rate of 27.4%. Of 260, the 207 returned respondents adopt TQM (79.6%).

In order to know whether the effect of non-response bias is significant between those who responded early with those who responded late. We compared the total sales volume, size of organization, type of industry, and practice TQM program between those who responded early with those who responded late. A Chi square tests and the t tests were performed. The null hypothesis of this analysis is that an early respondent has the same characteristics as a late respondent. The observed significant level p for all variables is much higher than 0.05. This implies that in this research the extent of non-response bias is insignificant, and the results are generalizable to the sampling frame. The following section reports results from factor analyses and regression analyses.

Analyses and Results

Factor Analyses

In this research, principle component analysis using varimax rotation was employed to explore the data for possible data reduction. Items in the same factor with a loading factor greater than 0.40 were grouped together. Table 1-3 shows the results of factor analysis with varimax rotation for Organizational Performance (OPER), Process Alignment (PALI) and People Involvement (PINV).

Using exploratory factor analysis for the 5 Organizational Performance items, the principal component method was employed. This factor is chosen to explain 49.86 percent of the variances. The varimax rotation method is used to obtain easier explanations of Organizational Performance. The highest loading of each item on all common factors is shown in Table 1.

Table 1. *Varimax Rotation Component Analysis Factor Matrix for Organizational Performance Variables*

Items		Loading
Organizational Performance		
P01	Organization's competitive position improved over last two years	0.821
P02	Productivity of employees increased over last two years	0.807
P03	Organization's profitability increased over last two years	0.744
P04 (Reverse)	Quality of products and services NOT improved over last two years	0.577
P05	Average cost per unit of product or service decreased over last two years	0.529

Using exploratory factor analysis for the 18 Process Alignment items. These were reorganized into four factors: Horizontal Structure Alignment, IT Competency Alignment, Strategy Alignment and Measuring IT & Improvement. Four common factors are chosen to explain 53.22 percent of the variances of the 18 items since each of their corresponding eigenvalues is greater than one. The varimax rotation method is used to obtain easier explanations of Process Alignment. The highest loading of each item on all common factors is shown in Table 2.

Table 2. *Varimax Rotation Component Analysis Factor Matrix for Process Alignment Variables*

Items		Loading
Horizontal Structure Alignment		
A05	A flat organizational structure	0.748
A06	Managerial tasks to front-line staff delegated	0.645
A01 (Reverse)	High barriers between departments	0.603
A04	Well practice horizontal communication	0.593
A02	Frequent use of process teams	0.406
IT Competency Alignment		
A08	State-of-the-art technology	0.840
A07	Technology enabled business processes to perform well	0.831
A11	Well integrated Information Technology systems across functional units	0.756
A03	Customer satisfied with response time	0.411
Strategic Alignment		
A17	Current strategic plan identified actually undertaken	0.792
A18	Strategic planning process actually encourages information sharing and cross-functional cooperation	0.718
A13	Management team identified core processes	0.710
A14	Core processes important input into strategic plan	0.570
A12	Developed strategies based on customer needs	0.503
A16	Sufficient measures permit clear tracking of performance	0.496
Measuring IT & Improvement		
A10	Information Technology important to improvement of business processes	0.776
A15	Operational improvements had direct impact on ability to compete	0.732
A09	Amount of data shared by employees increasing	0.541

Using exploratory factor analysis for the 9 People Involvement items were grouped into two factors: Executive Commitment and Employee Empowerment. The principal component method was employed. Two common factors are chosen to explain 57.34 percent of the variances of the 9 items, since each of their corresponding eigenvalues is greater than one. The varimax rotation method is used to obtain easier explanations of People Involvement. The highest loading of each item on all common factors is shown in Table 3. As shown in Table 1 to Table 3, the results of the factor analysis suggest that the factor structure of the questionnaire is stable and provides strong evidence for the discriminant validity of the measurement instrument.

Table 3. *Varimax Rotation Component Analysis Factor Matrix for People Involvement Variables*

Items		Loading
Executive Commitment		
E01	Top management has received adequate training in managing core processes	0.804
E02	Top management has sufficient knowledge on how to manage core processes	0.801
E03	Top management actively communicates to employees on how best to manage core processes	0.796
E05	Top management allocates adequate resources to improve core processes	0.727
E04	Top management expressly recognizes the need to identify core processes	0.711
Employee Empowerment		
E07	Employees increasing autonomy in making decisions that affect work	0.867
E06	Employees increasing involvement in the way their work is planned	0.821
E08	Employees encouraged to fix problems they encounter	0.565
E09	Employees interacting more with external customers	0.538

Correlation Analyses

In this section, correlation analyses were performed to determine the association between components of independent variables: PALI, PINV and the dependent variable: OPER. The results of correlation coefficients and significant levels are depicted in Table 4. All components of PALI and PINV are positively associated with OPER except Measuring IT & Improvement in PALI.

Table 4. *Correlation Coefficient and Significant Levels Between Components of Independent Variables: PALI, PINV and Dependent Variable: OPER*

Variable	Component	R	Sig. (n)	Result
PALI	Strategy Alignment (SALI)	+ 0.411	0.000 (n = 202)	Positive Association
	IT Competency Alignment (TALI)	+ 0.217	0.002 (n = 202)	Positive Association
	Horizontal Structure Alignment (HORI)	+ 0.165	0.019 (n = 202)	Positive Association
	Measuring IT & Improvement (MIIM)	+ 0.090	0.202 (n = 202)	Negative Association
PINV	Employee Empowerment (EEMP)	+ 0.324	0.000 (n = 205)	Positive Association
	Executive Commitment (ECOM)	+ 0.274	0.000 (n = 205)	Positive Association

Linear Regression Analysis

Since factor scores are used for three-components of independent variables PALI and two-components of independent variables PINV to one dependent variable, and also factor scores are used for both PALI and PINV as two independent variables to one dependent variable, the correlation coefficients for both components of independent variables PALI and PINV are zero.

The enter procedure is employed and the significant level set at 0.05. Table 5 reported unstandardized regression coefficients. The R-square (adjusted R-square) is 0.244 (0.232), 0.179 (0.170), and 0.132 (0.124) for the three models respectively. Table 5 shows that (1) the effects of Strategy Alignment (SALI), IT Competency Alignment (TALI) and Horizontal Structure Alignment (HORI) on Organization Performance (OPER) are significant at the level of 0.000, 0.001 and 0.008, respectively. Hence, the all three factors are all positively related to Organizational Performance. (2) the effects of Executive Commitment (ECOM) and Employee Empowerment (EEMP) on Organization Performance (OPER) are all significant at the level of 0.000. Hence, the two factors are also positively related to Organizational Performance. (3) the effects of PALI and PINV on OPER are significant at the level of 0.000 and 0.013, respectively. Hence, the two variables are positively related to Organizational Performance.

Table 5. *Regression Analysis for Components of Independent Variables: PALI, PICO and Dependent Variable: OPER*

$\text{OPER} = 0.012 + 0.412 \text{ SALI}^{***} + 0.218 \text{ TALI}^{***} + 0.165 \text{ HORI}^{**}$ $\text{OPER} = 0.002 + 0.217 \text{ ECOM}^{***} + 0.323 \text{ EEMP}^{***}$ $\text{OPER} = 0.011 + 0.168 \text{ PALI}^{*} + 0.303 \text{ PINV}^{***}$ <p>Note: *represents the significant level at 0.05; **represents the significant level at 0.01 and ***represents the significant level at 0.001</p>

Discussions and Conclusions

This research found that three components of PALI: Horizontal Structure Alignment, IT Competency Alignment, and Strategy Alignment are each positively associated with Organizational Performance. These findings support previous studies (Lee and Dale, 1998; Ostroff, 1999; Sinclair, 1994; Zairi, 1997). Among components of PALI, only one component (Measuring IT & Improvement) is negatively associated with Organizational Performance. The researchers re-examining the three items of Measuring IT & Improvement factor, found the three items of Measuring IT & Improvement factor hardly represented the concept of Horizontal Structure Alignment, IT Competency Alignment and Strategy Alignment. In other word, Measuring IT & Improvement factor was not included in the concept of PALI. This research also found that components of PINV: Executive Commitment and

Employee Empowerment are each positively associated with organizational performance. These findings are confirmed by the previous research as well (Arthur, 1994; Huselid, 1995; Powell, 1995).

As an aggregate concept, this research found that Process Alignment, including Horizontal Structure Alignment, Strategy Alignment, and IT Competency Alignment, is positively associated with Organizational Performance. To date, many studies have been conducted on the individual components of PALI (Horizontal Structure Alignment, Strategy Alignment and IT Competency Alignment) and business performance. No empirical evidence except the present study, however, was found in the literature to support the relationship between business performance and the aggregate of all three concepts in one study. This research also found that People Involvement, as an aggregate concept, is positively associated with Organizational Performance. Stronger leadership and commitment from top management towards managing core processes, and providing more authority to employees to manage their work, tend to achieve better performance of an organization. No empirical evidence except the present study was found in the literature to support the relationship between these two factors as an aggregate concept and business performance in one study. The research also found that interaction between the concept of PALI and PINV together positively supports the association with organizational performance.

In sum, this research shows that the notion of Process Alignment and People Involvement are related to organizational performance. Core processes and people are two key points of implementing TQM. This paper confirms that from the process management point of view, structure, strategy and IT should be aligned and aggregated together with TQM environment to improve organizational performance. This research also found top management commitment and people empowerment should combine along with TQM to influence organizational performance. At last, based on the result and discussion of our research, one of our future research avenues is to extend the research model by adding a different set of independent variables, and examine its impact on organizational performance.

Implications for Research and Practice in HRD

The findings of this research have implications for research and practice. This research contributes to a better understanding of the field of TQM. The results provide useful insight into the organization that use TQM as a organization development program. It also provides empirical evidence for guiding principles that TQM literature advocates: get your strategic objectives aligned with business processes, demonstrate executive commitment and empower your employee. Concentrate on these and while there is no certainty; the chances of achieving successful TQM will be amplified.

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